REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-20 are currently pending. Claims 1 and 10 have been amended by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, Claims 1-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Czernin et al. reference. ("Let's Play PET, http://www.crump.UCLA.edu/software/lpp/lpphome.html")[1] (hereinafter "the Czernin et al. reference") in view of U.S. Patent No. 6,628,743 to Drummond et al. (hereinafter "the '743 patent").

Amended Claim 1 is directed to an image processing apparatus, comprising: (1) an index computing unit configured to compute motion functional indices of a particular organ from volume data of a subject including the particular organ; (2) a polar map generating unit configured to generate a polar map by developing the indices on a polar coordinate system; (3) an image generating unit configured to generate, from the volume data, an image related to a structure of one of the particular organ and a peripheral organ developed on the polar coordinate system; (4) a fusing unit configured to fuse the image into the polar map; and (5) a display unit configured to display the polar map fused with the image. Claim 1 has been amended to correct minor informalities and no new matter has been added.

Regarding the rejection of Claim 1 under 35 U.S.C. § 103(a), the Office Action asserts that the Czernin et al. reference discloses everything in Claim 1 with the exception of the image generating unit, and relies on the '743 patent to remedy that deficiency.

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[1] Applicants note that, although the Office asserts that the Czernin et al. reference is a website that was last updated on September 14, 2000, Applicants have been unable to verify this assertion. Moreover, Applicants have been unable to access the Czernin et al. reference at the URL cited by the Office; the Let's Play PET material appears to be unavailable at this time.

The Czernin et al. reference is directed to a website that provides a tutorial on positron emission tomography (PET) including the use of PET in cardiology. In particular, the Czernin et al. reference discloses that polar maps may be generated from NH3 tracer images of various planes so that information about the entire myocardium can be displayed in a single image. However, as admitted in the outstanding Office Action, the Czernin et al. reference fails to disclose an image generating unit configured to generate, from volume data, an image related to a structure of one of a particular organ and a peripheral organ developed on the polar coordinate system, as recited in Claim 1. Moreover, Applicants respectfully submit that the Czernin et al. reference fails to disclose an index computing unit configured to compute motion functional indices of a particular organ from volume data of a subject including the particular organ, as recited in Claim 1. Rather, the Czernin et al. reference merely discloses polar maps created from NH3 tracer images. The Czernin et al. reference is silent regarding motion functional indices of a particular organ. Moreover, Applicants respectfully submit that the Czernin et al. reference fails to disclose a fusing unit configured to fuse the image (generated by the image generating unit) into the polar map, and a display unit configured to display the polar map fused with the image, as recited in Claim 1. The Czernin et al. reference is silent regarding fusing an image into the polar map, wherein the image is generated from volume data and the polar map is generated based on motion functional indices derived from the volume data, as recited in Claim 1.

The '743 patent is directed to an apparatus for the acquisition and analysis of cardiac image data. As shown in Figures 2 and 3, the '743 apparatus includes a medical scanner for generating first and second volumes of cardiac image data in a single examination; a data acquisition system for acquiring at least one of the first and second volumes of cardiac image data; an image reconstructor for reconstructing a viewable image from at least one of the first and second volumes of cardiac image data; a database for storing information from the data acquisition system; and a computer including at least one post-processing algorithm for analyzing the reconstructed volume of cardiac image data and displaying the at least one viewable image.

However, Applicants respectfully submit that the '743 patent fails to disclose a fusing unit configured to fuse an image generated by an image generating unit related to a structure of a particular organ and a peripheral organ developed on the polar coordinate system into the polar map, and to display the polar map fused with the image. In this regard, Applicants note that the '743 patent is silent regarding polar maps. Rather, the '743 patent merely discloses generating cardiac images based on CT image data. The fusing of image data onto a polar map generated by developing motion functional indices on a polar coordinate system, as recited in Claim 1, is not taught or suggested by the '743 patent. The '743 patent does not disclose an index computing unit configured to compute motion functional indices of a particular organ from volume data of a subject including the particular organ, as recited in Claim 1.

Thus, no matter how the teachings of the Czernin et al. reference and the '743 patent are combined, the combination does not teach or suggest a fusing unit configured to fuse an image (generated by an image generating unit from volume data and related to a structure of one of a particular organ and a particular organ developed on the coordinate system) into the polar map (generated by a polar map generating unit configured to generate a polar map by developing the indices or the motion functional indices on a polar coordinate system), as recited in Claim 1. Neither reference discloses the index computing unit configured to compute motion functional indices recited in Claim 1, and the combined teachings of the Czernin et al. and the '743 patent fail to teach or suggest fusing an image related to a structure of one of a particular organ and a peripheral organ developed on a polar coordinate system into a polar map generated from motion functional indices, as recited in Claim 1.

Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and that the rejection of Claim 1 (and dependent Claims 2-9) should be withdrawn.

In the outstanding Office Action, the stated motivation for combining the teachings of the Czernin et al. reference and the '743 patents is that a "CT imaging generating unit helps diagnose cardiovascular without waiting to stabilize the patient before performing the critical diagnostic test and disorder and avoid the need for cervical inspection."[2] However, Applicants respectfully submit that the Office Action is simply stating perceived advantages of Applicants' invention as motivation to combine the cited references, without identifying that one of ordinary skill in the art would even have though to have addressed this problem. Moreover, Applicants note that the stated motivation for combining the references in the outstanding Office Action is merely a generalized statement regarding the advantages of CT imaging in general. Such hindsight reconstruction of Applicants' invention cannot be used to establish a *prima facie* case of obviousness.

Independent Claim 10 recites limitations analogous to the limitations recited in Claim 1. Accordingly, for the reasons stated above regarding the patentability of Claim 1, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and that the rejection of Claim 1 (and dependent Claims 11-18) should be withdrawn.

Independent Claim 19 is directed to an X-ray computed tomographic apparatus, comprising: (1) a data acquiring unit configured to acquire projection data of a subject; (2) a reconstructing unit configured to reconstruct one of multi-slice data and volume data based on said projection data; (3) an index computing unit configured to compute motion functional indices of a particular organ from one of the multi-slice data and the volume data; (4) a polar map generating unit configured to generate a polar map by developing the indices on a polar coordinate system; and (5) a display unit configured to display the polar map.

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[2] See pages 3 and 4 of the outstanding Office Action.

As discussed above, the Czernin et al. reference is directed to the generation of polar maps from NH3 tracer images of various planes. However, Applicants respectfully submit that the Czernin et al. reference fails to disclose an index computing unit configured to compute motion functional indices of a particular organ from one of the multi-slice data and the volume data, as recited in Claim 19. Accordingly, it follows that the Czernin et al. reference must also fail to disclose a polar map generating unit configured to generate a polar map by developing the indices on a polar coordinate system, as recited in Claim 19.

As discussed above, the '743 patent is directed to a method for acquiring and analyzing cardiac data of a patient. However, Applicants respectfully submit that the '743 patent fails to disclose an index computing unit configured to compute motional functional indices of a particular organ from one of the multi-slice data and volume data, and a polar map generating unit configured to generate a polar map by developing the indices on a polar coordinate system, as recited in Claim 19. As discussed above, the '743 patent fails to disclose motion functional indices, and is silent regarding polar maps.

Thus, no matter how the teachings of the Czernin et al. reference and the '743 patent are combined, the combination does not teach or suggest the index computing unit and the polar map generating unit recited in Claim 19. Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and the rejection of Claim 19 (and dependent Claim 20) should be withdrawn.

Thus, it is respectfully submitted that independent Claims 1, 10, and 19 (and all associated dependent claims) patentably define over any proper combination of the Czernin et al. reference and the '743 patent.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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